

REMARKS

Claims 1-19 are pending in the present application. Reconsideration of the claims is respectfully requested.

I. 35 U.S.C. § 102, Anticipation

The Office Action rejects claims 1, 5, 9, 13, 17, and 19 under 35 U.S.C. § 102 as being anticipated by *Avery* (U.S. Patent No. 6,611,883). This rejection is respectfully traversed.

Avery teaches a method and apparatus for implementing PCI DMA speculative prefetching in a message passing queue oriented bus system. FIG. 3 of *Avery* is as follows:

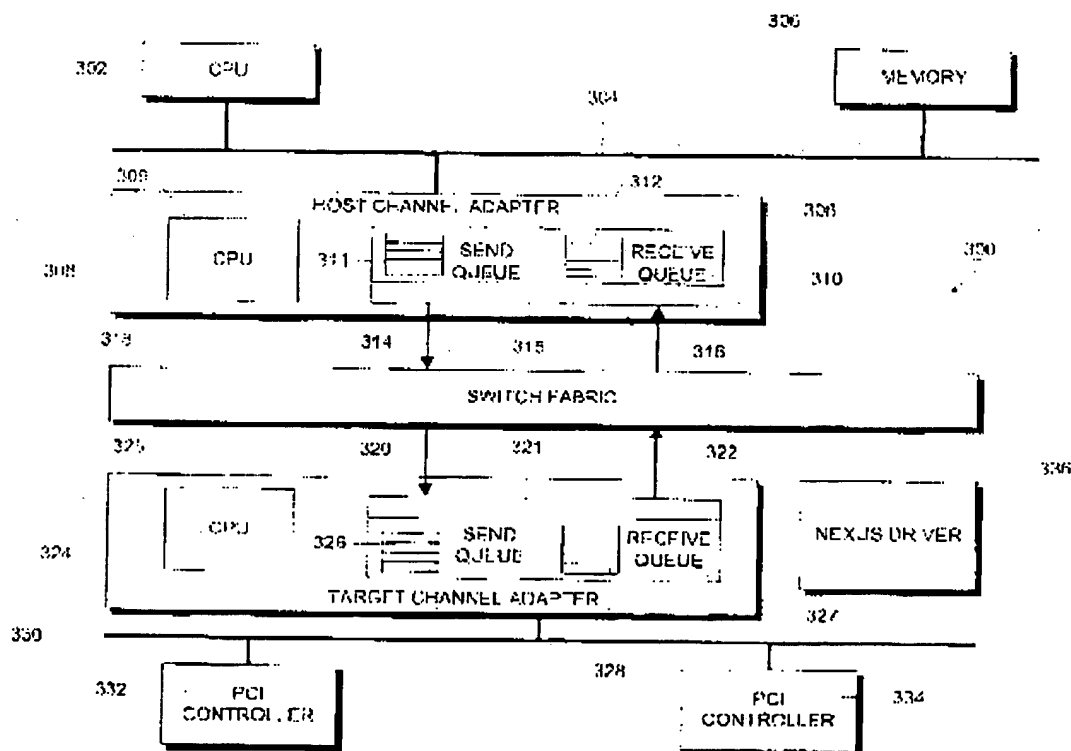


FIG. 3

When a device, such as central processing unit (CPU) 302, wishes to perform an operation using a peripheral component interconnect (PCI) device, such as PCI controller

332, for example, CPU 302 sends a work queue entry from send queue 311 of host channel adapter 308 to receive queue 328 in target channel adapter 324. Nexus driver 336 performs the queue oriented direct memory access (DMA) operation as a PCI based DMA operation. The target channel adapter, in conjunction with the nexus driver, acts as an InfiniBand-to-PCI bridge. See *Avery*, col. 5, line 44, to col. 7, line 33.

Before an actual transfer can take place, the nexus driver allocates an area of PCI address space for DMA operations in a translation protection table (TPT) in the host channel adapter. The TPT is used to translate virtual addresses to physical addresses. See *Avery*, col. 5, lines 59-63; col. 8, lines 1-17. In other words, in order for HCA 308 to transfer data from memory 306 to a PCI device, HCA 308 must translate between the virtual address of the PCI device and the physical address of the data in memory 306. InfiniBand address map 754 is used to associate work queue entries with regions in the PCI address space. InfiniBand address map 754 is stored in the InfiniBand-to-PCI bridge 324. Therefore, *Avery* teaches a TPT that maps virtual addresses to physical addresses at the source to form work queue entries for PCI DMA operations and an InfiniBand address map that associates work queue entries with regions in the PCI address space at the target.

In contradistinction, the present invention determines parameters needed to communicate with a remote node in a computer network. The present invention compiles a queue-pair-number map that associates unique queue pair numbers with services hosted by network nodes. When a client sends a service request, the queue-pair-number map is used to look up the queue pair number associated to the requested service. A reply to the client includes the address of the node hosting the requested service and the queue pair number associated with the requested service.

Avery does not teach or suggest a queue-pair-number map that associates queue pair numbers with services hosted by network nodes. Rather, *Avery* teaches a table that a host channel adapter uses to construct a work queue entry for a PCI DMA transfer. However, *Avery* does not teach or suggest how the host channel adapter determines the queue pair number of the target channel adapter. In fact, *Avery* does not teach any recognition that such a problem exists. Thus, it follows that *Avery* does not teach or fairly suggest receiving a service request from a client, looking up the queue pair number

associated to the requested service, and replying to the client, wherein the reply includes the address of the node hosting the requested service and the queue pair number associated with the requested service, as recited in claim 1, for example.

The Office Action alleges that the InfiniBand address map of *Avery* is equivalent to the claimed queue-pair-number map. However, the InfiniBand address map of *Avery* merely maps work queue entries in the target channel adapter with regions in the PCI address space. *Avery* does not teach that the InfiniBand address map is used by a client to look up a queue pair number of a service.

The Office Action also alleges that a work queue entry is equivalent to looking up the queue pair number associated to the requested service. Applicants respectfully disagree. In order for a work queue entry to be sent from the host channel adapter to the target channel adapter in *Avery*, the host must know the queue pair number of the target. *Avery* is concerned with mapping between work queue entries and PCI address spaces, not with mapping services with queue pair numbers, as in the claimed invention.

Furthermore, the Office Action alleges that the Remote Key, or R-Key, of *Avery* is equivalent to replying with the address of the node hosting the requested service and the queue pair number associated with the requested service. Applicants respectfully disagree. The R-Key of *Avery* is used by the host channel adapter to select appropriate page tables for translating virtual memory addresses to physical memory addresses. The R-Key is assigned when the nexus driver reserves memory space for the PCI operations, not responsive to a service request from a client. See *Avery*, col. 9, lines 21-30. The R-Key of *Avery* also does not include an address of a node hosting a requested service and a queue pair number associated with the requested service, as recited in claim 1, for example.

Independent claims 9 and 17 recite subject matter addressed above with respect to claim 1 and are allowable for similar reasons.

With respect to claims 5, 13, and 19, the Office Action does not specifically address these claims. For instance, the Office Action does not point out where *Avery* allegedly teaches associating a service hosted by the node with a well-known queue pair number, wherein the well-known queue pair number corresponds to at least one well-known port in the node, receiving a service request from a client, wherein the request is

addressed to the well-known queue pair number, and replying to the client, wherein the reply contains attributes necessary for communication with the requested service, as recited in claim 5, for example. *Avery* is silent as to well-known queue pair numbers, well-known ports, and sending a reply to a client where the reply includes attributes necessary for communication with a requested service. As such, the Office Action does not establish a *prima facie* case of anticipation for claim 5. Independent claims 13 and 19 recite subject matter addressed above with respect to claim 5 and are allowable for similar reasons.

Therefore, Applicants respectfully request withdrawal of the rejection of claims 1, 5, 9, 13, 17, and 19 under 35 U.S.C. § 102.

II. Objection to Claims

The Office Action states that claims 2-4, 6-8, 10-12, 14-16, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for the indication of allowable subject matter. However, Applicants believe claims 2-4, 6-8, 10-12, 14-16, and 18 are allowable by virtue of being dependent on claims 1, 5, 9, 13, and 17, as discussed above. Therefore, Applicants forego rewriting these claims in independent form at this time.

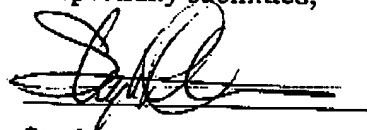
III. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE: June 15, 2005

Respectfully submitted,



Stephen R. Tkacs
Reg. No. 46,430
Yee & Associates, P.C.
P.O. Box 802333
Dallas, TX 75380
(972) 385-8777
Agent for Applicants